

In the Claims:

Listing of all claims:

1-24. (Cancelled.)

1 25. (Previously Added) A welding, cutting or
2 heating system capable of receiving a range of input
3 voltages spanning at least two input utility voltages,
4 comprising:

5 an input circuit configured to receive any input
6 voltage within the range of input voltages, and configured
7 to provide a first dc signal;

8 a converter configured to receive the first dc
9 signal and to provide a converter output, and configured to
10 receive at least one control input;

11 an output circuit configured to receive the
12 converter output and to provide a welding, heating or
13 cutting signal; and

14 a controller, including a power factor correction
15 circuit, configured to provide at least one control signal
16 to the converter.

1 26. (Currently Amended) The system of claim 25,
2 further comprising an auxiliary power source configured to
3 receive the any input voltage within the range of input voltages
4 and configured to provide a control power signal to the
5 controller.

1 27. (Currently Amended) The system of claim 26,
2 wherein the auxiliary power ~~controller~~ source is capable of
3 providing the control power signal at a preselected control
4 signal voltage, regardless of the magnitude of the any input
5 voltage.

1 28. (Previously Added) The system of claim 27,
2 wherein the output circuit further comprises a pulsed
3 transformer.

1 29. (Previously Added) The system of claim 28,
2 wherein the convertor includes a boost circuit.

1 30. (Previously Added) The system of claim 29,
2 wherein the output circuit includes a pulse width modulator
3 connected to the transformer.

31. (Cancelled)

1 32. (Currently Amended) A method of providing
2 welding, cutting or heating current from a range of input
3 voltages spanning at least two input utility voltages,
4 comprising:

5 receiving the an input voltage from within the
6 range and converting it to a first dc bus having a voltage
7 magnitude higher than the input voltage;

8 controlling the converting, including power factor
9 correcting by controlling a switch; and

10 receiving the dc bus and providing in response
11 thereto an output current having an output magnitude
12 suitable for a welding, heating or cutting.

1 33. (Previously Added) The method of claim 32,
2 wherein converting includes rectifying.

1 34. (Currently Amended) The method of claim 32,
2 further comprising deriving auxiliary power ~~from any~~ the input
3 voltage within the range of input voltages and providing the
4 derived auxiliary power as a power signal to a controller.

1 35. (Currently Amended) The method of claim 34,
2 wherein providing the derived auxiliary power includes providing
3 the derived auxiliary power at a preselected control signal
4 voltage, regardless of the magnitude of the input voltage.

1 36. (Previously Added) The method system of claim 34,
2 wherein providing in response thereto includes pulsing a
3 transformer.

1 37. (Previously Added) The method of claim 36,
2 wherein converting includes boost converting.

1 38. (Previously Added) The method of claim 37,
2 wherein providing in response thereto further comprises pulse
3 width modulating the transformer.

39. (Cancelled)

1 40. (Previously Added) The method of claim 38 wherein
2 providing in response thereto further comprises rectifying the
3 output of the transformer.

1 41. (Previously Added) A welding, cutting or
2 heating system capable of receiving a range of input
3 voltages spanning at least two input utility voltages,
4 comprising:

5 input means for receiving any input voltage within
6 the range of input voltages, and for providing a first dc
7 signal;

8 converter means for receiving the first dc signal
9 and providing a converter output in response to at least one
10 control input;

11 output means for receiving the converter output
12 and providing a welding, heating or cutting signal; and

13 control means for controlling, including power
14 factor correcting, the converter means, connected to the
15 converter means.

1 42. (Currently Amended) The system of claim 41,
2 further comprising auxiliary power means for providing a control
3 power signal to the controller control means in response to
4 receiving the any input voltage within the range of input
5 voltages.

1 43. (Currently Amended) The system of claim 42 ~~41~~,
2 wherein the auxiliary power means is further for providing the
3 control power signal at a preselected control signal voltage
4 regardless of the magnitude of the any input voltage.

1 44. (Previously Added) The system of claim 41,
2 wherein the output means further comprises means for pulsing a
3 transformer.

1 45. (Previously Added) The system of claim 44,
2 wherein the convertor means includes means for boosting a
3 voltage.

1 46. (Previously Added) The system of claim 44,
2 wherein the output means further includes means for pulse width
3 modulating the transformer.

47. (Cancelled)

1 48. (Previously Added) A power source for
2 welding, cutting or heating current, comprising:
3 means for receiving and converting an input
4 voltage from a range of input voltages spanning at least two

5 input utility voltages to a first dc bus having a voltage
6 magnitude higher than the input voltage;

7 means for controlling the means for receiving and
8 converting, including means for power factor correcting by
9 controlling a switch, connected to the means for receiving
10 and converting; and

11 means for receiving the dc bus and providing in
12 response thereto an output current having an output
13 magnitude suitable for a welding, heating or cutting.

1 49. (Previously Added) The power source of claim 48,
2 wherein the means for receiving and converting includes means for
3 rectifying.

1 50. (Currently Amended) The power source of claim 48,
2 further comprising means for deriving auxiliary power from the
3 input voltage ~~any voltage within the range of input voltages~~ and
4 providing the derived power as a power signal to the means for
5 controlling.

1 51. (Currently Amended) The power source of claim
2 ~~34~~ 50, wherein the means for deriving auxiliary power includes
3 means for providing the derived auxiliary power at a preselected
4 control signal voltage, regardless of the magnitude of the input
5 voltage.

1 52. (Currently Amended) The power source of claim
2 ~~36~~ 51, wherein the means for receiving and converting includes
3 means for boost converting to provide the first dc bus.

53. (Cancelled)

1 54. (Currently Amended) A welding, cutting or
2 heating system capable of receiving a range of input

3 voltages spanning at least two input utility voltages,
4 comprising:

5 a power circuit comprising an input circuit, a
6 converter and an output circuit, wherein the power circuit
7 is capable of providing a welding cutting or heating output
8 without reconfiguring a the power circuit;

9 wherein the input circuit is configured to receive
10 any input voltage within the range of input voltages, and
11 configured to provide a first dc signal;

12 wherein the converter includes a boost circuit and
13 is configured to receive and boost the first dc signal and
14 to provide a converter output, and configured to receive at
15 least one control input;

16 wherein the output circuit is configured to
17 receive the converter output and to provide the welding,
18 heating or cutting signal; and

19 a controller, including a power factor correction
20 circuit, configured to provide at least one control signal
21 to the converter.

1 55. (Currently Amended) The system of claim 54,
2 further comprising an auxiliary power circuit configured to
3 receive the any voltage within the range of input voltages and
4 configured to provide a control power signal to the controller.

1 56. (Previously Added) The system of claim 54,
2 wherein the output circuit further comprises a pulsed
3 transformer.

1 57. (Previously Added) The system of claim 56,
2 wherein the output circuit includes a pulse width modulator
3 connected to the transformer.

1 58. (Currently Amended) A method of providing
2 welding, cutting or heating current from a range of input
3 voltages spanning at least two input utility voltages,
4 comprising:

5 receiving ~~the~~ an input voltage and converting it
6 to a first dc bus having a voltage magnitude higher than the
7 input voltage, without reconfiguring a power circuit;

8 controlling the converting, including power factor
9 correcting by controlling a switch; and

10 receiving the first dc bus and providing in
11 response thereto an output current having an output
12 magnitude suitable for a welding, heating or cutting.

1 59. (Previously Added) The method of claim 58,
2 wherein converting includes rectifying.

1 60. (Currently Amended) The method of claim 59,
2 further comprising deriving auxiliary power from the input
3 voltage ~~any voltage within the range of input voltages~~ and
4 providing the derived power as a power signal to a controller.

1 61. (Previously Added) The method system of claim 60,
2 wherein providing in response thereto includes pulsing a
3 transformer.

62. (Cancelled.)

1 63. (Previously Added) A welding, cutting or
2 heating system capable of receiving a range of input
3 voltages spanning at least two input utility voltages,
4 comprising:

5 input means for receiving any input voltage within
6 the range of input voltages, and for providing a first dc
7 signal;

8 converter means for receiving and boosting the
9 first dc signal and providing a converter output in response
10 to at least one control input without reconfiguring a power
11 circuit;

12 output means for receiving the converter output
13 and providing a welding, heating or cutting signal; and

14 control means for controlling, including power
15 factor correcting, the converter means, connected to the
16 converter means.

1 64. (Currently Amended) The system of claim 63,
2 further comprising auxiliary power means for providing a control
3 power signal to the control means controller in response to
4 receiving the any voltage within the range of input voltages.

1 65. (Currently Amended) The system of claim 63,
2 wherein the output means further comprises means for pulsing a
3 transformer that receives the converter output.

66. (Cancelled.)

1 67. (Previously Added) A welding, cutting or
2 heating system capable, comprising:

3 a power circuit comprising an input circuit, a
4 converter and an output circuit, wherein the power circuit
5 is capable of providing a welding cutting or heating output;

6 wherein the input circuit is configured to receive
7 at least one input voltage, and provide a converter input
8 signal to the converter;

9 wherein the converter includes a boost circuit and
10 is configured to receive and boost the converter input
11 signal and to provide a dc bus output, and configured to
12 receive at least one control input;

13 wherein the output circuit is configured to
14 receive the dc bus, and to provide the welding, heating or
15 cutting signal;
16 a controller, including a power factor correction
17 circuit, configured to provide at least one control signal
18 to the converter; and
19 an auxiliary power circuit configured to receive
20 any voltage within a range of input voltages spanning at
21 least two utility voltages, and configured to provide a
22 control power signal to the controller.

1 68. (Previously Added) The system of claim 54,
2 wherein the output circuit further comprises a pulsed
3 transformer.

1 69. (Currently Amended) A method of providing
2 welding, cutting or heating current comprising:
3 receiving an the input voltage and converting it
4 to a first dc bus having a voltage magnitude higher than the
5 input voltage;
6 controlling the converting, including power factor
7 correcting by controlling a switch;
8 receiving the first dc bus and providing in
9 response thereto an output current having an output
10 magnitude suitable for a welding, heating or cutting; and
11 deriving auxiliary power from any voltage within a
12 range of input voltages spanning at least two utility
13 voltages, and providing the derived power as a power signal
14 to a controller.

1 70. (Previously Added) The method of claim 69,
2 wherein converting includes rectifying.

71. (Cancelled.)

1 72. (Currently Amended) A welding, cutting or
2 heating system, comprising:
3 input means for receiving any input voltage within
4 a the range of input voltages spanning at least two utility
5 voltages, and for providing a first dc signal;
6 converter means for receiving and boosting the
7 first dc signal and providing a converter output in response
8 to at least one control input;
9 output means for receiving the converter output
10 and providing a welding, heating or cutting signal;
11 control means for controlling, including power
12 factor correcting, the converter means, connected to the
13 converter means; and
14 auxiliary power means for providing a control
15 power signal to the controller in response to receiving the
16 ~~any voltage within a range of input voltages spanning at~~
17 ~~least two utility voltages.~~

73. (Cancelled.)

1 74. (Currently Amended) A welding, cutting or
2 heating power source capable of receiving a range of input
3 voltages, comprising:
4 an input rectifier configured to receive an ac
5 input, wherein the range includes a highest magnitude and a
6 lowest magnitude, and wherein the highest magnitude is at
7 least twice the lowest magnitude, and wherein the rectifier
8 is configured to provide a first dc signal;
9 a boost converter connected to receive the first
10 dc signal and provide a second dc output across a dc bus
11 comprising a positive bus and a negative bus, wherein the
12 boost converter is configured to receive at least one
13 control input, and wherein the boost converter includes a

14 boost inductor having a first end in electrical
15 communication with the rectifier, and the boost inductor has
16 a second end in electrical communication with a switch,
17 wherein when the switch is closed the second end is in
18 electrical communication with negative bus, and wherein the
19 second end is in electrical communication with a diode, and
20 the diode is further in electrical communication with the
21 positive bus, such that current can flow from the second end
22 through the diode to the positive bus;

23 a pulse width modulator connected to receive the
24 dc bus and provide a pulsed signal;

25 an output transformer, having a primary connected
26 to receive the pulsed signal and to provide an output signal
27 having a current suitable for welding or cutting on a
28 secondary;

29 a controller, including a power factor correction
30 circuit, configured to provide at least one control signal
31 to the converter; and

32 an auxiliary power source capable of providing a
33 control power signal at a preselected control signal
34 voltage, for a plurality of input voltages.

1 75. (Currently Amended) A method of providing
2 welding, cutting or heating power from a range of input
3 voltages, comprising:

4 rectifying an ac input, wherein the range includes
5 a highest magnitude and a lowest magnitude, and wherein the
6 highest magnitude is at least twice the lowest magnitude,
7 and wherein the rectifier is configured to provide a first
8 dc signal;

9 boost converting the first dc signal to a second
10 dc output across a dc bus comprising a negative and positive
11 bus, including receiving at least one control input, and
12 boosting through a boost inductor having a first end in

9
13 electrical communication with a rectifier, and a second end
14 in electrical communication with a switch, wherein when the
15 switch is closed the second end is in electrical
16 communication with negative bus, and wherein the second end
17 is in electrical communication with a diode, and the diode
18 is further in electrical communication with the positive
19 bus, such that current can flow from the second end through
20 the diode to the positive bus;

21 pulse width modulating the dc bus to provide a
22 pulsed signal;

23 transforming the pulsed signal to provide an
24 output signal having a current suitable for welding or
25 cutting;

26 controlling the boost converting to power factor
27 correct; and

28 providing auxiliary power at a control power
29 signal at a preselected control signal voltage, for a
plurality of input voltages.

1 76. (New) A welding, cutting or heating power
2 source, comprising:

3 an input circuit configured to receive an ac input and
4 to provide a first dc signal;

5 a converter configured to receive the first dc signal
6 and to provide a converter output, and configured to receive
7 at least one control input;

8 an output circuit configured to receive the converter
9 output and to provide a welding, heating or cutting signal;
10 and

11 a controller, including a power factor correction
12 circuit, configured to provide at least one control signal
13 to the converter.

1 77. (New) The apparatus of claim 76, further
2 including an auxiliary power source capable of providing a
3 control power signal to the controller at a preselected control
4 signal voltage, regardless of the magnitude of the ac input
5 signal.

1 78. (New) The apparatus of claim 77, wherein the
2 auxiliary power source includes an auxiliary transformer with a
3 plurality of primary taps.

1 79. (New) The apparatus of claim 76, wherein the
2 converter includes a boost circuit.

1 80. (New) The apparatus of claim 76, wherein the
2 output circuit includes a pulse width modulator.

1 81. (New) The apparatus of claim 80, wherein the
2 converter includes a boost circuit.

1 82. (New) The apparatus of claim 76 wherein the
2 output circuit includes an inverter.

1 83. (New) The apparatus of claim 76 wherein the
2 output circuit includes a rectifier.

1 84. (New) The apparatus of claim 76 wherein the
2 output circuit includes a cycloconverter.

1 85. (New) A method of providing a welding,
2 cutting or heating current, comprising:
3 boost converting and power factor correcting an ac
4 input signal to a second signal; and
5 changing the second signal into a third signal having a
6 current suitable for welding, cutting or heating.

1 86. (New) The method of claim 85 further
2 including providing control signals to a converter that cause the
3 converter to power factor correct.

1 87. (New) The method of claim 85, further
2 including providing auxiliary power signal by transforming the ac
3 input signal.

1 88. (New) The method of claim 85, wherein
2 changing includes pulse width modulating.

1 89. (New) The method of claim 85, wherein
2 changing includes inverting.

1 90. (New) A welding, cutting or heating power
2 source, comprising:
3 rectifier means for receiving an input signal and
4 providing a first dc signal;
5 converter means for receiving the first dc signal and
6 providing a converter output;
7 control means for controlling the converter means,
8 wherein the control means includes a power factor correction
9 means for power factor correction, connected to the
10 converter means;
11 output means for receiving the converter output and
12 providing a welding, heating or cutting signal.

1 91. (New) The apparatus of claim 90, wherein the
2 converter means includes a boost circuit.

1 92. (New) The apparatus of claim 91, wherein the
2 output means includes a pulse width modulator.

1 93. (New) The apparatus of claim 90, wherein the
2 output circuit includes an inverter.

1 94. (New) The apparatus of claim 90 wherein the
2 output circuit includes a rectifier.

1 95. (New) A welding or cutting power source,
2 comprising:
3 an input circuit configured to receive an input having
4 a magnitude over a range of inputs, wherein the range
5 includes a highest magnitude at least twice a lowest
6 magnitude, and to provide a first dc signal;
7 a boost converter, including a boost inductor connected
8 to receive the first dc signal, wherein the boost converter
9 has a dc bus output;
10 an output circuit configured to receive the dc bus
11 output and to provide a welding or cutting signal; and
12 a controller, including a power factor correction
13 circuit, configured to provide at least one control signal
14 to the boost converter.

1 96. (New) The apparatus of claim 95, further
2 including an auxiliary power source capable of providing a
3 control power signal at a preselected control signal voltage for
4 a plurality of magnitudes of the input signal.

1 97. (New) The apparatus of claim 96, wherein the
2 auxiliary power source includes an auxiliary transformer with a
3 plurality of primary taps.

1 98. (New) The apparatus of claim 95, wherein the
2 output circuit includes a switched circuit connected across the
3 dc bus, and a transformer having a primary connected in the
4 switched circuit.

1 99. (New) The apparatus of claim 98, wherein the
2 switched circuit is a pulse width modulator.

1 100. (New) The apparatus of claim 98, wherein the
2 output circuit includes an output rectifier connected to a
3 secondary of the transformer.

1 101. (New) The apparatus of claim 100, wherein the
2 switched circuit includes an inverter.

1 102. (New) The apparatus of claim 100 wherein the
2 output circuit includes an inductor connected to the output
3 rectifier.

1 103. (New) The apparatus of claim 95 wherein the
2 output circuit includes a cycloconverter.

1 104. (New) The apparatus of claim 103, further
2 comprising a first output stud connected to the inductor, and
3 disposed to be connected to one of a torch and a ground clamp,
4 and a second output stud, disposed to be connected to the other
5 of the torch and a ground clamp.